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(19)日本国特許庁 (JP)

(12)公開特許公報 (A)

(11)特許出願公開番号

特開平6-310273

(43)公開日 平成6年(1994)11月4日

(51) Int. Cl.⁵
H 05 B 33/10
33/04

識別記号 庁内整理番号

F I

技術表示箇所

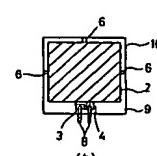
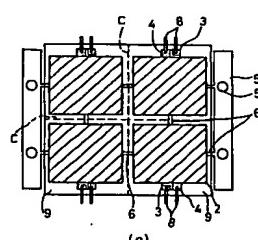
審査請求 未請求 請求項の数1 O L (全4頁)

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(54)【発明の名称】	EL素子の製造方法		

(57)【要約】

【目的】 EL素子の製造工程およびコストを低減するとともに、高品質維持を可能とするEL素子の製造方法を提供することにある。

【構成】 透明電極上1に発光層2a、誘電体層2b、背面電極2cよりなる積層部2を形成する工程の後、透明電極1の一部を切除して位置決め部5および橋絡部6を形成し、各積層部2を橋絡部6により橋絡し、同じく橋絡部6により各積層部2と橋絡された位置決め部5により各積層部2の位置決めを行ない、各積層部2を防湿フィルム9により被覆した後、防湿フィルム9を切断して複数のEL素子10を形成する。このため積層部2を防湿フィルム9により被覆する際の位置決めが高精度かつ容易に行なえるため、一定の品質を維持することを容易とするとともに、複数の積層部2を同時に被覆できるため、製造工程およびコストを低減するものである。



【特許請求の範囲】

【請求項1】 透明電極上に発光体層、誘電体層、背面電極の順にこれらを積層形成する工程と、リード接点にリード電極を装着する工程と、上記EL発光面の両面をリード電極の一部を除き保護フィルムにより被覆する工程とよりなるEL素子の製造方法において、
透明電極上に複数のEL素子の発光体層と誘電体層と背面電極となる積層部を形成する工程と、
位置決め部、個々のEL素子と成る各積層部、位置決め部および上記各積層部どうしを橋絡する橋絡部を除いて切除する工程と、
上記位置決め部を用いて位置を固定し各リード接点にリード電極を装着し、上記各積層部の両面を保護フィルムにより被覆した後、各積層部に対応して上記保護フィルムを切断し複数のEL素子を形成する工程とよりなるEL素子の製造方法。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明はEL(エレクトロルミネッセンス)素子の製造方法に関するものである。

【0002】

【従来の技術】 一般に、EL素子は、次のような製造工程で1枚ずつ製造されている。まず、やや大きめの透明電極上に発光体層、誘電体層、背面電極の順にこれらを積層形成し、同時に、透明電極および背面電極にリード接点を形成した後、不要部分を切り捨てて所定の形状に揃える。そして、治具等により固定して、リード接点にリード電極を接続し、一方の面に防湿フィルムを貼着し位置決めした後、もう一方の面に防湿フィルムを貼着してこれを被覆しEL素子を形成している。

【0003】

【発明が解決しようとする課題】 従来では、1枚ずつEL素子を製造していたので、生産効率が極めて悪かった。また、防湿フィルムを貼着する際の位置決めが難しく防湿フィルムがずれてしまうことがあり、一定の品質を維持することが難しく、かつ位置決めに時間を使い、生産効率が悪かった。

【0004】 本発明の目的は、EL素子の製造工程およびコストを低減するとともに、高品質維持を可能とするEL素子の製造方法を提供することにある。

【0005】

【課題を解決するための手段】 透明電極上に複数のEL素子個々の発光体層と誘電体層と背面電極となる積層部を形成を形成する工程を行なう。次に、位置決め部、個々のEL素子と成る各積層部、位置決め部および上記各積層部どうしを橋絡する橋絡部を除いて切除する工程を行なう。次に、上記位置決め部を用いて位置を固定し各リード接点にリード電極を装着し、上記各積層部の両面を保護フィルムにより被覆した後、各積層部に対応して上記保護フィルムを切断し複数のEL素子を形成する工

程を行なうことにより上記目的を達成する。

【0006】

【実施例】 次に、本発明の一実施例のEL素子の製造方法について図を参照しながら説明する。本例では、4個のEL素子を同時に形成するものとし、図1~4は本例の工程を示す工程図であり、これらに沿って本例の工程を説明する。まず、図1aに示すように、透明電極1上に、複数のEL素子個々の発光体層と誘電体層と背面電極となる積層部2を互いに離間して形成する。これら積層部2は、図1aのAA線での断面を表す図1bに示すように、まず、透明電極1上に、ZnS(Cu)等の発光体を含む発光体層2aを形成し、この上に誘電体層2b、背面電極2cの順にこれらを積層することにより形成されている。背面電極2cからはリード電極4を同種津してあるが、このリード接点4は、透明電極1上に突出して形成されていた誘電体層2b上に形成され、透明電極1とは絶縁されている。また、各積層部2に対応して、透明電極1上にはリード接点3が設けられる。さらに各積層部2の背面電極2c上には、リード接点4を除いて捕水層2dを設けてある。

【0007】 次に、図2に示すように、積層部2を設けた透明電極1の1部を切除して、透明電極1の位置を決定する位置決め孔5aを備えた位置決め部5と、位置決め部5、積層部2および各積層部2どうしを橋絡する橋絡部6とを形成する。同図において、各層積部2は橋絡部5により相互に橋絡されるとともに、同様に位置決め部5とも橋絡されているため、以降の工程に移行する際の取扱いが容易になる。また、図2の破線Bは、後述する保護フィルムとしての防湿フィルムの装着位置を示している。

【0008】 次に、図3に示すように、置台(図示せず。)に防湿フィルム9を載置した後、位置決め孔5aに、置台上に設けられた位置決め柱7を挿入して透明電極1を固定する。これにより、透明電極1上の各積層部2は、所定の位置に確実に固定されることとなる。透明電極1が固定されると、各リード接点3、4にリード電極8が装着される。次に、上方より防湿フィルム9にて透明電極1を各リード電極8共々被覆し、これを熱溶着して各積層部2を封止する。これにより、図4aに示す状態を得る。ここで、各積層部2を防湿フィルム9で封止する場合、通常、熱溶融型接着剤が用いられるが、橋絡部をなす透明電極との密着を考慮した場合、熱溶着の方が有効である。また、透明電極1のベースフィルムには、通常PET(ポリエチレンテレフタレート)が用いられているが、これは防湿フィルム(3フッ化エチレン)9と比較して透湿度が大きいため、水分の侵入を防ぐ意味でも熱溶着は有効である。また、熱溶着は各積層部2の外周および橋絡部6のみでも良い。

【0009】 次に、位置決め部5を切断し、図4aに示す破線Cにて各積層部2を封止した防湿フィルム9を切

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断し、図4 bに示す4個のEL素子10を形成する

【0010】本例は、各積層部2を橋絡部6により橋絡し、同じく橋絡部6により各積層部2と橋絡された位置決め部5により各積層部2の位置決めを行なうため、各積層部2を防湿フィルム9により被覆する際の位置決めが高精度かつ容易に行なえるため、一定の品質を維持することが容易となる。これとともに、複数の積層部2を同時に被覆できるため、製造工程およびコストを低減できる。

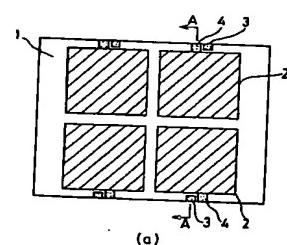
〔0011〕上記一実施例では、透明電極上に4個の積層部を形成して4個のEL素子を同時に形成することとしたが、これに限らず所望の数の積層部を形成して、任意の数のEL素子を同時に形成することが可能である。

【0012】また、上記実施例では、予め個々のEL素子となる各積層部を透明電極上に離間して形成することとしたが、透明電極上のほぼ全面に一つの積層部を形成し、位置決め部を形成する際に、不要部分を切除して個々のEL素子となる各積層部、これらを互いに橋絡する橋絡部を形成することとしてもよい。このとき、橋絡部上にも発光層、誘電体層、背面電極を有することとなるが何等問題はない。

[0013]

【発明の効果】本発明によれば、製造工程おとづるコストを

[图 1]



A cross-sectional diagram of a substrate assembly. It features a central insulating layer with two parallel conductive tracks, each labeled $2d$. The tracks are connected to a top metal layer through vias. A bottom metal layer is also shown. The diagram is labeled '(b)' at the bottom.

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を低減でき、高品質のEL素子を効率的に製造することが可能となる。

【図面の簡単な説明】

【図1】本発明の一実施例のEL素子の製造法の工程を示す説明図。

【図2】本発明の一実施例のEL素子の製造法の工程を示す説明図

【図3】本発明の一実施例のEL素子の製造法の工程を示す説明図。

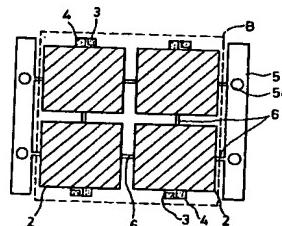
【図4】本発明の一実施例のEL素子の製造法の工程を示す説明図。

【符号の説明】

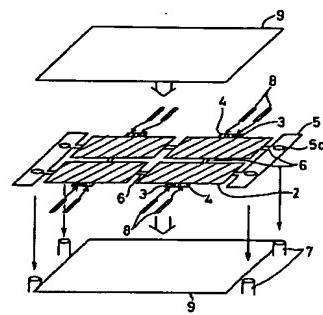
1 透明電

- | | |
|-----|--------|
| 1 | 透明電極 |
| 2 | 積層部 |
| 2 a | 発光体層 |
| 2 b | 誘電体層、 |
| 2 c | 背面電極 |
| 5 | 位置決め部 |
| 6 | 橋絡部 |
| 8 | リード電極 |
| 9 | 防湿フィルム |
| 1 0 | E L 素子 |

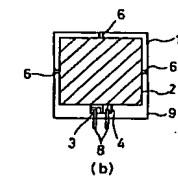
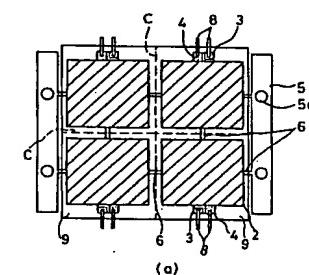
【図2】



[図3]



[図4]



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CLAIMS

[Claim(s)]

[Claim 1] The manufacture method of an EL element which becomes from an emitter layer, a dielectric layer, the process that carries out laminating formation of these at the order of a back plate, the process which equips with a lead electrode at a lead contact, and the process which covers both sides of the above-mentioned EL luminescence side with a protection film except for a part of lead electrode at the transparent-electrode top characterized by providing the following. The process which forms the laminating section used as the emitter layer of two or more EL elements, a dielectric layer, and a back plate on a transparent electrode. The process excised except for the bridging section which bridges the positioning section, each EL element and each laminating section which changes, the positioning section, and each above-mentioned laminating sections. The process which cuts the above-mentioned protection film corresponding to each laminating section, and forms two or more EL elements after fixing a position using the above-mentioned positioning section, equipping each lead contact with a lead electrode and covering both sides of each above-mentioned laminating section with a protection film.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the manufacture method of EL (electro luminescence) element.

[0002]

[Description of the Prior Art] Generally, one EL element is manufactured at a time by the following manufacturing processes. First, laminating formation of these is carried out on a little larger transparent electrode at the order of an emitter layer, a dielectric layer, and a back plate, and simultaneously, a garbage is omitted and step is kept with a predetermined configuration, after forming a lead contact at a transparent electrode and a back plate. And it fixes with a fixture etc. and a lead electrode is connected to a lead contact, after sticking and positioning a moisture-proof film to one field, a moisture-proof film is stuck on another field, this is covered, and the EL element is formed.

[0003]

[Problem(s) to be Solved by the Invention] In the former, since it was manufacturing one EL element at a time, productive efficiency was very bad. Moreover, it was difficult for positioning at the time of sticking a moisture-proof film to be difficult, and for a moisture-proof film to shift, and to maintain fixed quality, and positioning took time and productive efficiency was bad.

[0004] The purpose of this invention is to offer the manufacture method of the EL element which enables quality maintenance while reducing the manufacturing process and cost of an EL element.

[0005]

[Means for Solving the Problem] The process which forms formation for the laminating section used as two or more emitter layers of EL-element each, a dielectric layer, and a back plate on a transparent electrode is performed. Next, the process excised except for the bridging section which bridges the positioning section, each EL element and each laminating section which changes, the positioning section, and each above-mentioned laminating sections is performed. Next, after fixing a position using the above-mentioned positioning section, equipping each lead contact with a lead electrode and covering both sides of each above-mentioned laminating section with a protection film, the above-mentioned purpose is attained by performing the process which cuts the above-mentioned protection film corresponding to each laminating section, and forms two or more EL elements.

[0006]

[Example] Next, it explains, referring to drawing about the manufacture method of the EL element of one example of this invention. By this example, four EL elements shall be formed simultaneously, and drawing 1 - 4 are process drawing showing the process of this example, and they explain the process of this example along with these. First, as shown in drawing 1 a, on a transparent electrode 1, the laminating section 2 used as two or more emitter layers of EL-element each, a dielectric layer, and a back plate is estranged mutually, and is formed. As shown in drawing 1 b showing the cross section in AA line of drawing 1 a, these laminatings section 2 forms emitter layer 2a containing emitters, such as ZnS (Cu), on a transparent electrode 1 first, and is formed by carrying out the laminating of these to the

order of dielectric-layer 2b and back plate 2c on this. Although of-the-same-kind Tsu of the lead electrode 4 has been carried out, this lead contact 4 is formed on dielectric-layer 2b currently projected and formed on the transparent electrode 1, and is insulated from back plate 2c in the transparent electrode 1. Moreover, corresponding to each laminating section 2, the lead contact 3 is established on a transparent electrode 1. Furthermore on back plate 2c of each laminating section 2, 2d of ***** is prepared except for the lead contact 4.

[0007] Next, as shown in drawing 2, the one section of the transparent electrode 1 which formed the laminating section 2 is excised, and the positioning section 5 equipped with tooling-holes 5a which determines the position of a transparent electrode 1, and the bridging section 6 which bridges the positioning section 5, the laminating section 2, and each laminating section 2 are formed. In this drawing, since the positioning section 5 is similarly bridged while each stacked-volume section 2 is mutually bridged by the bridging section 5, the handling at the time of shifting to subsequent processes becomes easy. Moreover, the dashed line B of drawing 2 shows the wearing position of the moisture-proof film as a protection film mentioned later.

[0008] Next, as shown in drawing 3, after laying the moisture-proof film 9 in a table (not shown), the positioning pillar 7 prepared in the table is inserted in tooling-holes 5a, and a transparent electrode 1 is fixed to it. By this, each laminating section 2 on a transparent electrode 1 will certainly be fixed to a position. Fixation of a transparent electrode 1 equips each lead contacts 3 and 4 with the lead electrode 8. next, the upper part -- the moisture-proof film 9 -- a transparent electrode 1 -- each lead electrode 8 -- it covers together, heat welding of this is carried out, and each laminating section 2 is closed This acquires the state which shows in drawing 4 a. The heat welding is more effective when adhesion with the transparent electrode which makes the bridging section although thermofusion type adhesives are usually used when closing each laminating section 2 with the moisture-proof film 9 is taken into consideration here. Moreover, although PET (polyethylene terephthalate) is usually used for the base film of a transparent electrode 1, the meaning of heat welding this preventing the invasion of moisture from since the moisture vapor transmission is large as compared with the moisture-proof film (3 ethylene fluoride) 9 is also effective. moreover, heat welding -- the periphery of each laminating section 2, and the bridging section 6 -- it is good

[0009] Next, the positioning section 5 is cut, the moisture-proof film 9 which closed each laminating section 2 with the dashed line C shown in drawing 4 a is cut, and four EL elements 10 shown in drawing 4 b are formed.

[0010] Since this example can be performed with high precision [in order to position each laminating section 2 by the positioning section 5 which bridged each laminating section 2 by the bridging section 6, and was similarly bridged by the bridging section 6 with each laminating section 2 / positioning at the time of covering each laminating section 2 with the moisture-proof film 9], and easily, it becomes easy [maintaining fixed quality]. Since two or more laminating sections 2 can be simultaneously covered with this, a manufacturing process and cost can be reduced.

[0011] Although [the one above-mentioned example] the four laminating sections are formed and four EL elements are simultaneously formed on a transparent electrode, it is possible to form the laminating section of the number not only of this but requests, and to form arbitrary numbers of EL elements simultaneously.

[0012] Moreover, although [the above-mentioned example] each laminating section which serves as each EL element beforehand is estranged and formed on a transparent electrode, in case [of / on a transparent electrode] the one laminating section is mostly formed in the whole surface and the positioning section is formed, it is good also as forming each laminating section which excises a garbage and serves as each EL element, and the bridging section which bridges these mutually. At this time, although it will have a luminous layer, a dielectric layer, and a back plate also on the bridging section, it is satisfactory in any way.

[0013]

[Effect of the Invention] According to this invention, a manufacturing process and cost can be reduced and it becomes possible to manufacture a quality EL element efficiently.

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TECHNICAL FIELD

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PRIOR ART

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EFFECT OF THE INVENTION

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TECHNICAL PROBLEM

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[0004] The purpose of this invention is to offer the manufacture method of the EL element which enables quality maintenance while reducing the manufacturing process and cost of an EL element.

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MEANS

[Means for Solving the Problem] The process which forms formation for the laminating section used as two or more emitter layers of EL-element each, a dielectric layer, and a back plate on a transparent electrode is performed. Next, the process excised except for the bridging section which bridges the positioning section, each EL element and each laminating section which changes, the positioning section, and each above-mentioned laminating sections is performed. Next, after fixing a position using the above-mentioned positioning section, equipping each lead contact with a lead electrode and covering both sides of each above-mentioned laminating section with a protection film, the above-mentioned purpose is attained by performing the process which cuts the above-mentioned protection film corresponding to each laminating section, and forms two or more EL elements.

[Translation done.]

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EXAMPLE

[Example] Next, it explains, referring to drawing about the manufacture method of the EL element of one example of this invention. By this example, four EL elements shall be formed simultaneously, and drawing 1 -4 are process drawing showing the process of this example, and they explain the process of this example along with these. First, as shown in drawing 1 a, on a transparent electrode 1, the laminating section 2 used as two or more emitter layers of EL-element each, a dielectric layer, and a back plate is estranged mutually, and is formed. As shown in drawing 1 b showing the cross section in AA line of drawing 1 a, these laminatings section 2 forms emitter layer 2a containing emitters, such as ZnS (Cu), on a transparent electrode 1 first, and is formed by carrying out the laminating of these to the order of dielectric-layer 2b and back plate 2c on this. Although of-the-same-kind Tsu of the lead electrode 4 has been carried out, this lead contact 4 is formed on dielectric-layer 2b currently projected and formed on the transparent electrode 1, and is insulated from back plate 2c in the transparent electrode 1. Moreover, corresponding to each laminating section 2, the lead contact 3 is established on a transparent electrode 1. Furthermore on back plate 2c of each laminating section 2, 2d of ***** is prepared except for the lead contact 4.

[0007] Next, as shown in drawing 2 , the one section of the transparent electrode 1 which formed the laminating section 2 is excised, and the positioning section 5 equipped with tooling-holes 5a which determines the position of a transparent electrode 1, and the bridging section 6 which bridges the positioning section 5, the laminating section 2, and each laminating section 2 are formed. In this drawing, since the positioning section 5 is similarly bridged while each stacked-volume section 2 is mutually bridged by the bridging section 5, the handling at the time of shifting to subsequent processes becomes easy. Moreover, the dashed line B of drawing 2 shows the wearing position of the moisture-proof film as a protection film mentioned later.

[0008] Next, as shown in drawing 3 , after laying the moisture-proof film 9 in a table (not shown), the positioning pillar 7 prepared in the table is inserted in tooling-holes 5a, and a transparent electrode 1 is fixed to it. By this, each laminating section 2 on a transparent electrode 1 will certainly be fixed to a position. Fixation of a transparent electrode 1 equips each lead contacts 3 and 4 with the lead electrode 8. next, the upper part -- the moisture-proof film 9 -- a transparent electrode 1 -- each lead electrode 8 -- it covers together, heat welding of this is carried out, and each laminating section 2 is closed. This acquires the state which shows in drawing 4 a. The heat welding is more effective when adhesion with the transparent electrode which makes the bridging section although thermofusion type adhesives are usually used when closing each laminating section 2 with the moisture-proof film 9 is taken into consideration here. Moreover, although PET (polyethylene terephthalate) is usually used for the base film of a transparent electrode 1, the meaning of heat welding this preventing invasion of moisture from since the moisture vapor transmission is large as compared with the moisture-proof film (3 ethylene fluoride) 9 is also effective. moreover, heat welding -- the periphery of each laminating section 2, and the bridging section 6 -- it is good

[0009] Next, the positioning section 5 is cut, the moisture-proof film 9 which closed each laminating section 2 with the dashed line C shown in drawing 4 a is cut, and four EL elements 10 shown in drawing

4 b are formed.

[0010] Since this example can be performed with high precision [in order to position each laminating section 2 by the positioning section 5 which bridged each laminating section 2 by the bridging section 6, and was similarly bridged by the bridging section 6 with each laminating section 2 / positioning at the time of covering each laminating section 2 with the moisture-proof film 9], and easily, it becomes easy [maintaining fixed quality]. Since two or more laminating sections 2 can be simultaneously covered with this, a manufacturing process and cost can be reduced.

[0011] Although [the one above-mentioned example] the four laminating sections are formed and four EL elements are simultaneously formed on a transparent electrode, it is possible to form the laminating section of the number not only of this but requests, and to form arbitrary numbers of EL elements simultaneously.

[0012] Moreover, although [the above-mentioned example] each laminating section which serves as each EL element beforehand is estranged and formed on a transparent electrode, in case [of / on a transparent electrode] the one laminating section is mostly formed in the whole surface and the positioning section is formed, it is good also as forming each laminating section which excises a garbage and serves as each EL element, and the bridging section which bridges these mutually. At this time, although it will have a luminous layer, a dielectric layer, and a back plate also on the bridging section, it is satisfactory in any way.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Explanatory drawing showing the process of the manufacturing method of the EL element of one example of this invention.

[Drawing 2] Explanatory drawing showing the process of the manufacturing method of the EL element of one example of this invention.

[Drawing 3] Explanatory drawing showing the process of the manufacturing method of the EL element of one example of this invention.

[Drawing 4] Explanatory drawing showing the process of the manufacturing method of the EL element of one example of this invention.

[Description of Notations]

1 Transparent Electrode

2 Laminating Section

2a Emitter layer

2b Dielectric layer,

2c Back plate

5 Positioning Section

6 Bridging Section

8 Lead Electrode

9 Moisture-Proof Film

10 EL Element

[Translation done.]

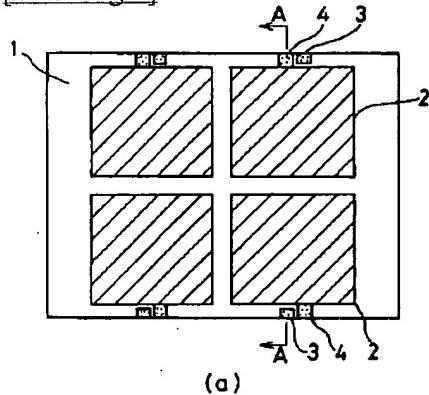
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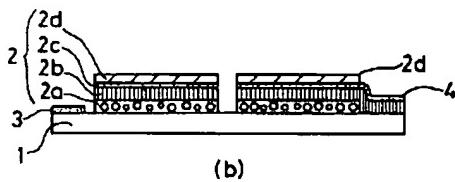
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DRAWINGS

[Drawing 1]

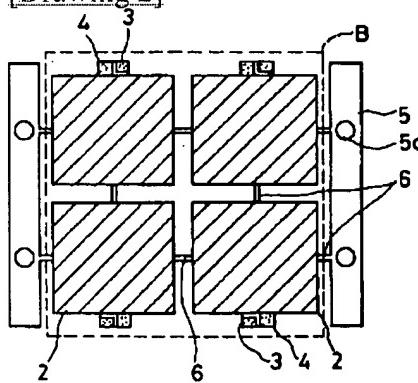


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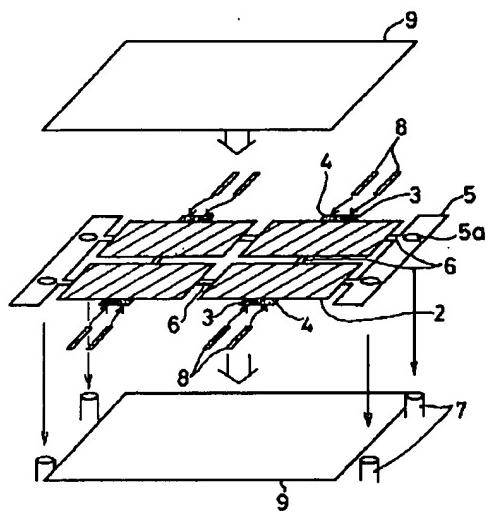


(b)

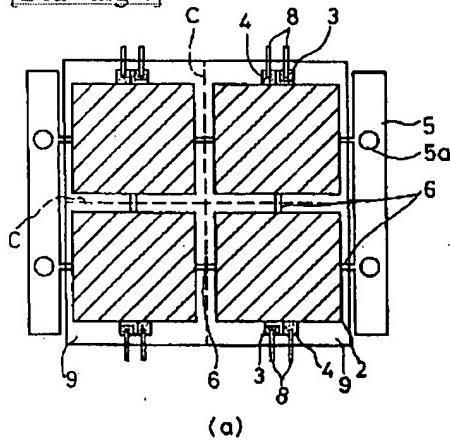
[Drawing 2]



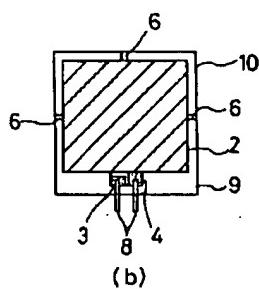
[Drawing 3]



[Drawing 4]



(a)



(b)

[Translation done.]